

DOCKET FILE COPY ORIGINAL

ORIGINAL

BEFORE THE

~~United States Communications Commission~~

## **TABLE OF CONTENTS**

	<b>PAGE</b>
<b>SUMMARY.....</b>	<b>iii</b>
<b>I. INTRODUCTION.....</b>	<b>3</b>
<b>II. SIGNAL SECURITY TECHNIQUES.....</b>	<b>11</b>
A. Classification and Important Aspects of Signal Protection.....	12
B. Signal Security Techniques.....	14
1. Traps.....	14
2. Interdiction.....	19
3. Scrambling.....	24
4. Broadband Descrambling.....	32
5. National Scrambling Standard.....	34
6. Renewable Security.....	40
7. Point of Entry ("POE").....	41
8. Switching.....	41
<b>III. CABLE ACT PRESSURES FOR SCRAMBLING.....</b>	<b>44</b>
A. Must-Carry and Retransmission Consent.....	45
B. Anti Buy-through.....	47
<b>IV. IMPROVING COMPATIBILITY.....</b>	<b>49</b>
A. Existing TVs and VCRs.....	49
1. Basic Service Tier Only.....	50
2. Basic Service Tier with Premium or Pay-Per-View.....	51
3. Other Tiers.....	52
B. New TVs and VCRs.....	54

	<b>PAGE</b>
C. The Decoder Interface Connector.....	56
1. The Decoder Interface Connector With VCRs.....	60
2. Picture-In-Picture.....	61
3. Signal Compression.....	62
4. Implementation.....	64
<b>V. A "CABLE READY" TECHNICAL STANDARD.....</b>	<b>68</b>
A. The Standard.....	68
B. Potential for Evasion.....	73
<b>VI. NOTIFICATION AND EDUCATION.....</b>	<b>75</b>
<b>VII. DIGITAL VIDEO.....</b>	<b>77</b>
<b>VIII. CONCLUSION.....</b>	<b>79</b>

#### **APPENDICES**

- Appendix 1 - Answers to Specific NOI Questions**
- Appendix 2 - Samples of Cable Compatible Devices  
Readily Available to Consumers**
- Appendix 3 - News Articles Regarding Electronic  
Deactivation of Illegal Descramblers  
in Queens, New York**

**SUMMARY**

In issuing its report to Congress and regulations implementing Section 624A of the 1992 Cable Act, the FCC is directed to balance the costs and benefits to consumers of imposing compatibility requirements on cable operators and consumer electronics equipment manufacturers against the need for cable operators to protect the integrity of their signals against theft or unauthorized reception. In striking this balance, the Commission must acknowledge that legitimate signal security concerns outweigh the convenience of certain optional features that are contained on some high-end consumer electronic equipment. The U.S. Constitution recognizes the importance of protecting the rights of artists through its copyright provisions and cable television must not be allowed to become a mechanism whereby those fundamental rights are violated. Indeed, in 1991 cable subscribers, cable company investors, programmers and local franchising authorities were asked to bear the costs resulting from an estimated \$4.7 billion in signal theft losses. Ill-conceived restrictions on scrambling would destroy the program, service and technological diversity that Congress intended to foster in enacting both the 1984 and 1992 Cable Acts and at the same time increase customer costs.

- The FCC Must Not Restrict Cable's Use Of Scrambling, The Most Effective Signal Security Technique.

Of the signal security approaches in use today, scrambling is the most practical and flexible. Scrambling, when coupled with addressability, has allowed for the introduction of new services such as multichannel impulse pay-per-view and near video



different channels or to consecutively record programming on two different channels at different times.

In any case where certain features of the subscriber's video equipment are not compatible with certain cable services, the subscriber may purchase new electronics equipment which has the capability to receive those services, or supplementary equipment that will allow the receipt of additional services on the subscriber's existing equipment may be purchased from numerous sources or rented from the cable operator. In all cases, compatibility can be established. The consumer education procedures mandated by Congress in Section 623(c)(2)(B)(i) should be highly effective in assuring that consumers are able to make informed choices and to create a greater demand for currently-available devices capable of addressing the specified compatibility issues.

- Cable Compatible Remote Controls And Converters Are Readily Available To Consumers. Section 624A(c)(2)(C) Does Not Apply To Descramblers.

Congress' desire that cable compatible converters and remote control devices be available for purchase has already materialized. Universal and programmable remote control devices as well as converters which extend the tuning range of older TVs and VCRs are readily available at very modest prices from numerous electronics retail outlets and catalogs. In contrast to remote controls and converters, and consistent with the statute's recognition of legitimate signal security concerns, the 1992 Cable Act does not require that descramblers or other signal security hardware be made commercially available. The proprietary nature of signal security equipment is crucial to the

cable industry's ability to combat theft of service and minimize the costs of signal theft to cable subscribers, investors and regulators alike, and must not be compromised by requiring the manufacture of descramblers for sale to the general public.

- The Commission Should Adopt Specific "Cable Ready" Standards For Any New Consumer Electronics Equipment Capable Of Tuning Cable Channels.

With respect to new TVs and VCRs, a critical need exists for technical standards to define "cable ready" equipment. An important part of that standard is a universal descrambler interface, sometimes referred to as a decoder interface connector, which meets the EIA/ANSI 563 standard agreed upon by the consumer electronics and cable television industries. A mandate for all new "cable ready" equipment to provide the decoder interface connector will make scrambling transparent and allow consumers to utilize the optional features of their TVs and VCRs in a cost effective manner.

A number of technical standards which should be required in order for a TV or VCR to be marketed as "cable ready." These include standards pertaining to tuner range, tuner quality, shielding, forced tuning and infrared pass through, back feed and signal leakage, signal splitting, the requirement for a source selection switch which provides adequate switch isolation and the requirement for mandating that the tuner in any TV or VCR be replaceable so that it can be upgraded as technology and cable channel capacity increases beyond the capacity of the existing tuner.

Furthermore, consumers must be protected from devices which claim or imply the ability to function properly when connected to

cable. The potential for evasion of this provision of the Cable Act must be precluded. Consumers who buy equipment which tunes to cable channels logically assume that such equipment will work when hooked up to their cable system and are understandably upset when this is not the case. In order to prevent this, TVs or VCRs or other devices which do not comply with the technical definition of "cable ready," should not be permitted to tune to cable channels.

Finally, both the cable and the consumer electronics industries must be required to provide adequate notification to consumers who are either purchasing electronics products or subscribing to cable. Without informed choice, mistakes, frustrations and confusion will result. Both industries should work together to jointly create a notification that will advise consumers of the various compatibility problems and potential solutions that might be encountered when connecting a particular device to the local cable system. Such notification should be affixed to the product at point of sale and should also be provided to any subscriber upon initiation of cable service. By working together to raise consumer awareness, much of the frustration and anger over perceived incompatibility problems can be substantially diminished, or eradicated entirely, at minimal costs to consumers, the cable industry and the consumer electronics industry.



BEFORE THE  
**Federal Communications Commission**

WASHINGTON, D.C. 20554

RECEIVED  
MAR 22 1993  
FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF THE SECRETARY

In the Matter of: )  
 )  
Implementation of Section 17 of )  
the Cable Television Consumer )  
Protection and Competition Act of 1992 ) ET Docket No. 93-7  
 )  
Compatibility Between Cable Systems )  
and Consumer Electronics Equipment )  
 )

Time Warner Entertainment Company, L.P. ("Time Warner"), by its attorneys, hereby respectfully submits these comments in response to the Commission's Notice of Inquiry in ET Docket No. 93-7 ("NOI").<sup>1</sup> Time Warner is a partnership, which is primarily owned (through subsidiaries) and fully managed by Time Warner Inc., a corporation whose securities are publicly traded. Time Warner is comprised principally of three unincorporated divisions: Time Warner Cable, which operates cable systems; Home Box Office, which operates pay television programming services; and Warner Bros., which produces and distributes motion pictures and television programs.

---

<sup>1</sup>Notice of Inquiry in ET Docket 93-7, FCC 93-30, \_\_\_\_ FCC Rcd. \_\_\_\_ (released January 29, 1993).

Time Warner is the plaintiff in a lawsuit pending in Federal District Court in Washington, D.C., in which it takes the position, inter alia, that various provisions of the Cable Television Consumer Protection and Competition Act of 1992<sup>2</sup> violate its rights under the First Amendment to the United States Constitution.<sup>3</sup> Although Time Warner has not directly challenged the constitutionality of Section 624A of the 1992 Cable Act, Time Warner submits these comments without prejudice to its claims and arguments in that lawsuit.

The body of these comments contains a general, though detailed, discussion of various issues raised in the NOI. Appendix 1 to these comments contains specific responses to the numerous questions raised in the NOI. Often, these responses are elaborated upon more fully and placed within a meaningful context within the main text. Appendix 2 to these comments contains photocopies of various advertisements illustrating the ready market availability and modest cost of converters, universal remote controls and other equipment that facilitates the compatibility of consumer electronics equipment, such as TVs and VCRs, and cable systems. Appendix 3 to these comments contains news articles describing the electronic deactivation of illegal descramblers in Queens, New York and underscores the need for

---

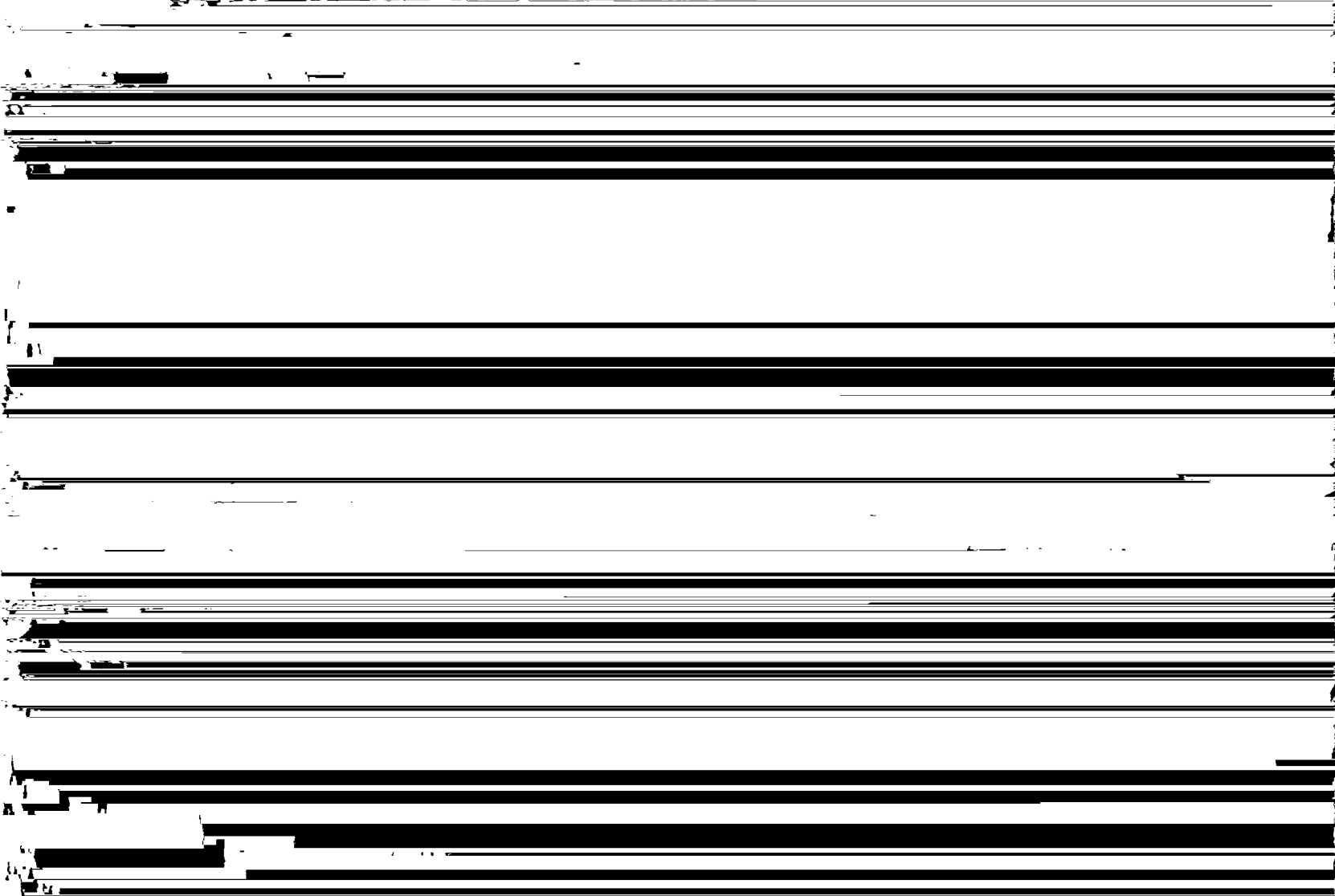
<sup>2</sup>Cable Television Consumer Protection and Competition Act of 1992, Pub. L. No. 102-385, 106 Stat. 1460 ("1992 Cable Act").

<sup>3</sup>See Time Warner Entertainment Company, L.P. v. FCC, Civil Action No. 92-2494 (D.D.C. filed November 5, 1992).

cable operators to maintain proprietary control over descrambling equipment.

# **I. INTRODUCTION**

The 1992 Cable Act directs the FCC to issue a report to Congress "on means of assuring compatibility between televisions and video cassette recorders and cable systems, consistent with the need to prevent theft of cable service. . . ."<sup>4</sup> In issuing these regulations, the Commission is required to balance the costs and benefits to consumers of imposing compatibility requirements on cable operators and consumer electronics equipment manufacturers against the need for cable operators to protect the integrity of the signals transmitted by the operator



through existing, readily available devices,<sup>6</sup> coupled with a consumer education program as directed by Congress,<sup>7</sup> and without requiring cable operators to compromise signal security.

Signal security is essential to the continued diversity of programming and information sources which both the 1984 and the 1992 Cable Acts seek to promote.<sup>8</sup> Indeed, signal security promotes constitutionally protected copyright interests. The U.S. Constitution recognizes the importance of protecting the rights of artists through its copyright provisions.<sup>9</sup> The flow of diverse ideas and programming depends on the ability of artists to protect the fruits of their labors. As cable becomes an increasingly important mechanism for the publication and distribution of the work product of artists, care must be taken to ensure that it does not become a means whereby the copyrights of artists are violated. Signal security along all parts of the cable distribution path is essential to this end. The artist's rights must be protected from the source all the way to the ultimate consumer.

The need for signal security transcends the provision of entertainment programming. New services under development for

---

<sup>6</sup>Examples of such devices available commercially can be found in Appendix 2.

<sup>7</sup>47 U.S.C. Section 544A(c)(2)(B)(i).

<sup>8</sup>See 1984 Cable Act at Section 601(4); 1992 Cable Act at Section 2(b)(1).

<sup>9</sup>See U.S. Const. Art. 1, §8, cl. 8.

multi-media and telecommunication applications for cable require

subscriber privacy protection. When medical records or images

the choice of an appropriate signal security technology is

cases, equipment incompatibility is the result of a lack of standards or the multiplicity of standards applicable to the same consumer electronics products or features. For example, in the case of VCRs, there are VHS, Super VHS, Beta, Super Beta, 8mm, VHS-C, and Hi-8 formats. In the case of audio equipment, there are the audio cassette, Compact Disk ("CD"), the recently introduced Digital Audio Tape ("DAT"), Digital Compact Cassette ("DCC"), and the recordable Mini Disk ("MD") formats. The older Eight Track tape, 45<sub>rpm</sub> and 33 $\frac{1}{3}$ <sub>rpm</sub>, and even 78<sub>rpm</sub> records still exist in consumers' homes. In almost all cases, these formats are incompatible with each other and require their own equipment.

Similarly, the remote control unit that comes with a consumer's VCR is practically never compatible with the remote control used with the television set. Moreover, the button pushing sequence for changing channels, or for setting clocks and timers in VCRs and TVs are usually different. A consumer who has two different VCRs, even of the same brand, will often have to use a different button sequence to operate the clock and timer. The array of buttons, switches and cables involved in just watching TV and using a VCR can be mind boggling to some consumers. When a cable box is added, it often becomes the straw that breaks the camel's back and is sometimes blamed for all the difficulty. Yet, even if the cable subscription is cancelled and an antenna connected, there is little simplification in operation of these devices.

The fact is that consumers are forced to make choices every time they purchase a piece of consumer electronics equipment. Should the consumer purchase an 8mm format video camera to obtain improved picture quality, or sacrifice picture quality in order to obtain compatibility with existing VHS format VCR equipment? Should the consumer purchase a less expensive audio cassette player for the automobile even though CDs are used at home? Consumers who desire to subscribe to cable service are faced with similar choices when the equipment the subscriber already owns does not allow access to all the services available on cable. Among such choices are the following:

- (a) Don't subscribe to optional cable services beyond the capabilities of existing consumer electronics equipment.
- (b) Purchase new consumer electronics equipment with adequate capability.
- (c) Purchase supplementary equipment.
- (d) Rent supplementary equipment from the cable operator.

In many instances, these choices must be made not because of the signal security method employed by the cable operator, but because of limitations found in the consumer electronics equipment owned by the subscriber. For example, when technology makes it possible to economically expand cable channel capacity beyond the capability of a subscriber's equipment, that subscriber must make a choice. He may ignore the channels beyond



his capacity, buy new TVs or VCRs, buy an appropriate converter,<sup>11</sup> or rent a converter from the cable operator. The last two choices may result in a reduction in the ability to use features which came with the subscriber's existing TV or VCR.

Similarly, if the tuner in the TV or VCR has inadequate shielding and suffers from Direct Pick Up ("DPU") of over-the-air signals, a choice is required. The subscriber must choose between degraded picture quality (or even loss of the channel), purchasing a better TV or VCR, purchasing a supplementary converter, or renting a supplementary converter from the cable

languages, etc. New signal components have been proposed to the FCC which would allow program identification and the automatic setting of clocks in TVs and VCRs.<sup>12</sup> If the subscriber's current equipment cannot respond to these signal components, the subscriber must choose between foregoing the services provided or purchasing new equipment. The choice belongs to the subscriber.

It is everyone's experience that technology evolves. New features and new products are introduced daily. In electronic products, we have come to expect that prices will come down while new features will be introduced and quality and reliability will be improved. Who hasn't experienced the introduction of a less expensive, better performing product with more advanced features just a year or two after purchasing a previous model? While this causes chagrin, no one would argue that progress should be halted to prevent such frustrations, or that consumer electronics manufacturers should upgrade previous models for free every time improvements are introduced. Likewise, it is unreasonable to expect to limit the introduction of new cable services just to prevent a requirement for the subscriber to make a choice which may involve the purchase or rental of new or supplemental equipment. The subscriber always has the choice to decline the new services and retain the current level of functionalities of his consumer electronics equipment. If a non-scrambled broadcast basic service tier is offered, the subscriber may chose to limit

---

<sup>12</sup>See Notice of Proposed Rulemaking in MM Docket No. 92-305, FCC Rcd. \_\_\_, FCC 92-556 (released December 31, 1992).

service to that level in order to retain the maximum functionality of his equipment. In that case, he almost always has more channels to choose from than he would have had with just an antenna. Ultimately, consumers can always decline cable service entirely and be free of any cable-related limitations.

The cable subscriber makes choices every month. Included are which programs to add, which to discontinue, and whether to remain a subscriber at all. In making those choices, the subscriber must weigh the time available for viewing, the costs of the programming, other activities and demands on time and money, and the impact taking some programming may have on his ability to use features of equipment he has already purchased.

## **II. SIGNAL SECURITY TECHNIQUES**

Despite the fact that signal security techniques are only one of several causes of consumer electronics incompatibility, the 1992 Cable Act and Commission's NOI focus almost entirely upon incompatibility caused by scrambling and encryption techniques utilized by cable operators to secure their programming.<sup>13</sup> Time Warner submits that the Commission should not, under any circumstances, place any restrictions on a cable operator's use of scrambling, by far the most effective and flexible signal security technique available today. This is particularly so given that each of the consumer electronics equipment functions identified by Congress can be accommodated

---

<sup>13</sup>See 47 U.S.C. Sections 544A(a)(1)-(3); 544A(b)(1)-(2); 544A(c); and NOI at ¶¶8-10.

through existing, readily available devices,<sup>14</sup> coupled with a consumer education program as directed by Congress,<sup>15</sup> without requiring cable operators to compromise signal security. Ill-conceived restrictions on scrambling would destroy the program, service and technological diversity that Congress intended to foster in enacting both the 1984 and 1992 Cable Act and at the same time increase customer costs.

In response to the Commission's request for information on the current technologies and practices used by cable systems to deliver their services and secure their signals, the following is a description of the principal techniques currently utilized for that purpose.

**A. Classification and Important Aspects of Signal Protection**

There are two general approaches to signal protection. These are Supply Security (where hardware must be installed to allow a subscriber to have access to the signal desired) and Denial Security (where hardware must be installed to prevent access to the signal by unauthorized viewers). From a business standpoint, supply security has a significant advantage over denial security approaches in most cases. Unlike supply security, where the cost of installing additional equipment is offset by the additional revenue to be derived from the user of that equipment, denial security requires equipment to be

---

<sup>14</sup>See Appendix 2.

<sup>15</sup>47 U.S.C. Section 544A(c)(2)(B)(i).

installed for each subscriber who elects not to take the secured service. Thus, with denial security, the costs are incurred for those subscribers who do not generate the additional revenue needed to cover those costs, contrary to sound business practices.

Regardless of the approach utilized, there are factors which can be utilized to judge the efficiency of a particular security technology. These are:

Level of Security: the degree of invulnerability to compromise or defeat.

Hiding ability: the degree of unintelligibility of video and audio in a protected signal.

Recoverability: the freedom from impairments in the signal ultimately provided to a subscriber.

Compatibility with Addressability: the ability to make the signal protection method addressable.

Channel Incremental: the protection of additional channels or blocks of channels requires more hardware; a non-channel incremental signal security method will control any number of channels without requiring additional hardware.

Compatibility with Consumer Electronics: the degree to which certain consumer electronics features may be compromised when a subscriber chooses to take a service via the signal protection method.

Cost effectiveness: the balance between affordability and the other aspects of signal protection.<sup>16</sup>

---

<sup>16</sup>Cost effectiveness is an issue of prime importance. The compatibility provision of the 1992 Cable Act clearly indicates Congress' concern over costs. See, e.g., Sections 624A(c)(1)(A); 624A(c)(2)(B)(ii).

It is also important to differentiate between "address-

ability" and "comprehension" the two terms are sometimes used

energy from the cable drop for channels the subscriber does not wish to purchase. Negative traps are a form of denial security. This has been a very successful approach where a cable system has limited channel capacity with just a few premium channels. Negative traps make the most sense where most of the subscribers take a premium service and their subscription is stable. In these situations just a few traps need to be installed and they typically remain in place for long periods of time. Traps are relatively inexpensive to purchase but are labor intensive to install, remove, and monitor. They require continuous monitoring because they are vulnerable to tampering. They are not practical for subscriptions which change frequently and do not allow pay-per-view. The expansion of channel capacity and the availability of a great deal of choice in programming has made this approach obsolete as the sole method of securing signals.

Positive traps are an example of supply security. They are used to enable viewing of particular channels the subscriber wishes. They remove an interfering carrier which is inserted at the cable headend. This carrier tends to scramble the signal. TV and VCR receivers vary in the degree of disruption suffered by this method. Some receivers provide impaired but very recognizable pictures without installation of the positive trap. This can be a problem where a subscriber finds the video content

of the programming objectionable.<sup>17</sup> Positive traps can be considered as a primitive, non-addressable descrambler. They are used where a minority of subscribers take a service and those subscriptions are stable. In these situations just a few traps need to be installed and they remain in place for long periods of time. As with negative traps, positive traps are relatively inexpensive to purchase but are labor intensive to install and remove.

Negative traps are typically installed on a pole or in a pedestal where they are relatively inaccessible to the subscriber. Positive traps, on the other hand, are typically installed within the subscriber's premises. Recovery of positive traps from former subscribers is a problem. Mere possession of the trap allows further viewing of the protected service. If the subscriber claims the trap was lost or stolen, there is little that can be done to recover it. Positive traps are not practical for subscriptions which change frequently. Positive traps have the further disadvantage that they tend to soften the picture for subscribers who take the service. They can be easily manufactured and sold illegally. Their unauthorized use is

---

<sup>17</sup>Several provisions of the 1992 Cable Act evidence Congress' concern with allowing objectionable programming into a subscriber's home. See, e.g., Section 10 (protection from indecent, obscene and sexually explicit programming on leased and PEG access channels); Section 15 (notification and blocking of free previews on services offering X, NC-17 or R-rated programming).



extremely difficult to detect since they are usually installed within the home.

There are severe limitations on the applicability of traps. It is difficult to restrict the impact of negative traps to just one channel. Usually the lower adjacent channel's audio signal is attenuated. This can cause problems with stereo reception. In more severe cases, monaural audio quality is impacted. The effect on adjacent channels increases as the trapped channel's frequency goes up. Attempting to use negative traps to secure channels in or above the super-band channels can result in the loss of several adjacent channels. Additionally, all traps are temperature sensitive and tend to drift with age. A trap may no longer be effective several years after installation. Eventually, it might drift to impact the wrong channel.

Another problem with all traps is that controlling more channels requires more traps or more filter elements in a trap, i.e., traps are channel incremental. However, more than three or four traps can cause electrical and mechanical problems. Electronically, the losses caused by traps accumulate and make them impractical. Their losses must be made up with amplifiers or higher tap output levels. In-home amplifiers are a problem because they may oscillate, add noise, or distort the signal if overloaded. If the output level is too high, poor in-home connections can cause significant signal leakage. Amplifiers require power and if disconnected, result in a trouble call. Mechanically, when several negative traps are used, the structure